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Final Technical Report
NASA Grant NAG 5-1482
H1504+65: An Extraordinarily Hot
Compact Star

John A. Nousek

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This report describes the activities at Penn State University supported by NASA Grant NAG5-1482, "H1504+65: An Extraordinarily Hot Compact Star". This final report covers the entire grant period, from December 15, 1990 to April 1, 1992.

The purpose of this grant was to support the data analysis of my approved ROSAT Guest Investigator program to observe H1504+65, an extremely hot white dwarf star. A modest supplement to this proposal was added under the authority of Dr. Alan Bunner of NASA HQ to support my travel expenses to attend U.S. ROSAT User's Committee meetings (which I joined in November, 1990.)

The observations of H1504 were conducted fortuitously in July, 1990, during the PCV (Pre-measurement, Calibration and Verification) phase of ROSAT observations. Unfortunately despite this early collection of data trouble with the SASS software which performs the pipeline data reduction prevented my receiving any useful data until a little more than one month ago. As no useful scientific analysis could be applied until that time I refrained from charging any salary support to this grant until the data were received. My current plan is to retain the unexpended balance, request a No-Cost extension and continue work on the analysis for roughly six months past the original termination date, in accordance with the delay of the data receipt.

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Since the data have been received I, with the assistance of Mr. Jeff Mendenhall, PSU grad student in Astronomy and Astrophysics, have loaded the data into the IRAF/PROS data analysis packages and examined the images of H1504 collected in the B filter and clear settings.

Despite the early lack of data I also arranged (using other internal PSU funds) to travel to the University of Leicester, Great Britain, and viewed both the ROSAT PSPC and WFC data from H1504+65. I used the occasion to form a collaboration to study the H1504 data in all ROSAT energies with Dr. Martin Barstow of Leicester and Dr. Klaus Werner of the Institut für Theoretische Physik und Sternwarte der Universität der Kiel, Germany. Dr. Barstow will provide data from the WFC survey and pointed observations and Dr. Werner will provide detailed atmospheric models and optical data.

We were able to make preliminary estimates of the source intensity, variability and spectral shape. We also laid plans for our data analysis efforts and publication scheme.

Since then I have involved another graduate student in working with my ROSAT data, Mr. Chris Baluta. Mr. Baluta is in his first year of graduate school so is only available, due to teaching and course requirements, during academic holiday periods. Together, primarily over the Christmas vacation, we assembled a poster paper presentation for the Atlanta AAS meeting. Mr. Baluta and I both attended the meeting using support from this grant. A final paper summarizing my work will be prepared under support from my continuing ROSAT funding from other observations.

In addition to the above analysis effort I also attended the most recent meetings of the U.S. ROSAT User's Committee at the Goddard Space Flight Center in November, 1990, at the American Astronomical Society meeting in Seattle, Washington in June, 1991, and at the American Astronomical Society meeting in Atlanta, Georgia in January, 1992.